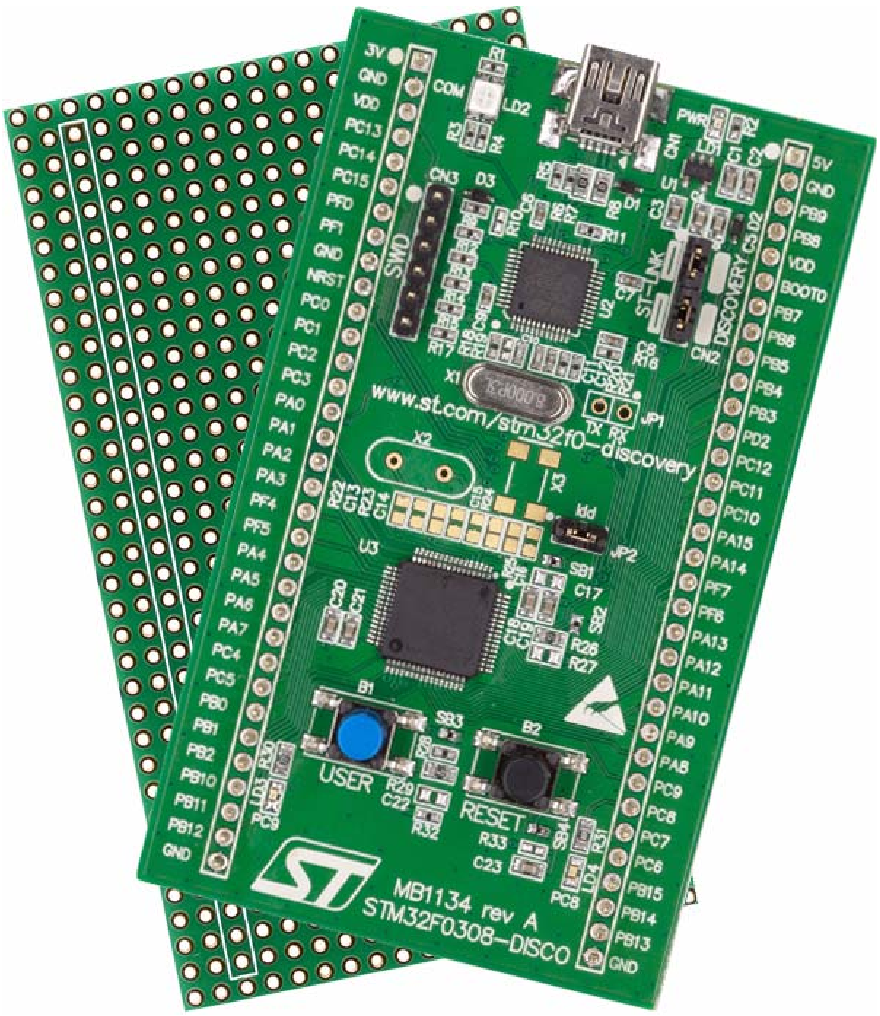
UM1658
User manual

Discovery kit for STM32F030 Value Line microcontrollers

Introduction

The STM32F030 Value Line Discovery kit (32F0308DISCOVERY) helps you to discover the device features and to develop your applications easily. It is based on STM32F030R8T6, an STM32 F0 series 32-bit ARM® Cortex™-M0 microcontroller, and includes an ST-LINK/V2 embedded debug tool, LEDs, push buttons and a prototyping board.

Figure 1. 32F0308DISCOVERY



Contents

List of tables

List of figures

1 Conventions

Table 1 provides the definition of some conventions used in the present document.

Table 1. ON/OFF conventions

Convention	Definition
Jumper JP1 ON	Jumper fitted
Jumper JP1 OFF	Jumper not fitted
Solder bridge SBx ON	SBx connections closed by solder
Solder bridge SBx OFF	SBx connections left open

2 Quick start

The STM32F030 Value Line Discovery kit is a low-cost and easy-to-use development kit to quickly evaluate and start development with an STM32 F0 series microcontroller.

Before installing and using the product, please accept the Evaluation Product License Agreement from *www.st.com/stm32f0-discovery*.

For more information on the STM32F030 Value Line Discovery kit and for demonstration software, visit *www.st.com/stm32f0-discovery*.

2.1 Getting started

Follow the sequence below to configure the STM32F030 Value Line Discovery kit and launch the DISCOVER application:

1. Check jumper position on the board, JP2 on, CN2 on (Discovery selected).
2. Connect the 32F0308DISCOVERY board to a PC with a USB cable ‘type A to mini-B’ through USB connector CN1 to power the board. Red LED LD1 (PWR) and LD2 (COM) light up and green LED LD3 blinks.
3. Press user button B1 (bottom left corner of the board).
4. Observe how the green LED LD3 blinking changes according to USER button B1 clicks.
5. Each click on USER button B1 is confirmed by the blue LED LD4.
6. To study or modify the DISCOVER project related to this demo, visit *www.st.com/stm32f0-discovery* and follow the tutorial.
7. Discover the STM32F0 features, download and execute programs proposed in the list of projects.
8. Develop your own application using available examples.

2.2 System requirements

- Windows PC (XP, Vista, 7)
- USB type A to Mini-B USB cable

2.3 Development toolchains supporting the 32F0308DISCOVERY

- Altium®, TASKING™ VX-toolset
- ARM®, Atollic TrueSTUDIO®
- IAR™, EWARM (IAR Embedded Workbench®)
- Keil™, MDK-ARM™

2.4 Order code

To order the STM32F030 Value Line Discovery kit, use the order code STM32F0308-DISCO.

3 Features

The STM32F030 Value Line Discovery kit offers the following features:

- STM32F030R8T6 microcontroller featuring 64 KB Flash, 8 KB RAM in an LQFP64 package
- On-board ST-LINK/V2 with selection mode switch to use the kit as a standalone ST-LINK/V2 (with SWD connector for programming and debugging)
- Board power supply: through USB bus or from an external 5 V supply voltage
- External application power supply: 3 V and 5 V
- Four LEDs:
  - LD1 (red) for 3.3 V power on
  - LD2 (red/green) for USB communication
  - LD3 (green) for PC9 output
  - LD4 (blue) for PC8 output
- Two push buttons (user and reset)
- Extension header for LQFP64 I/Os for quick connection to prototyping board and easy probing.
- An additional board is provided with the kit which can be connected to the extension connector for even easier prototyping and probing.
- A large number of free ready-to-run application firmware examples are available on *www.st.com/stm32f0-discovery* to support quick evaluation and development.

4 Hardware and layout

The STM32F030 Value Line Discovery board is designed around the STM32F030R8T6 microcontroller in a 64-pin LQFP package.

Figure 2 illustrates the connections between the STM32F030R8T6 and its peripherals (ST-LINK/V2, push button, LEDs and connectors).

Figure 3 and *Figure 4* help you to locate these features on the STM32F030 Value Line Discovery board.

Figure 2. Hardware block diagram

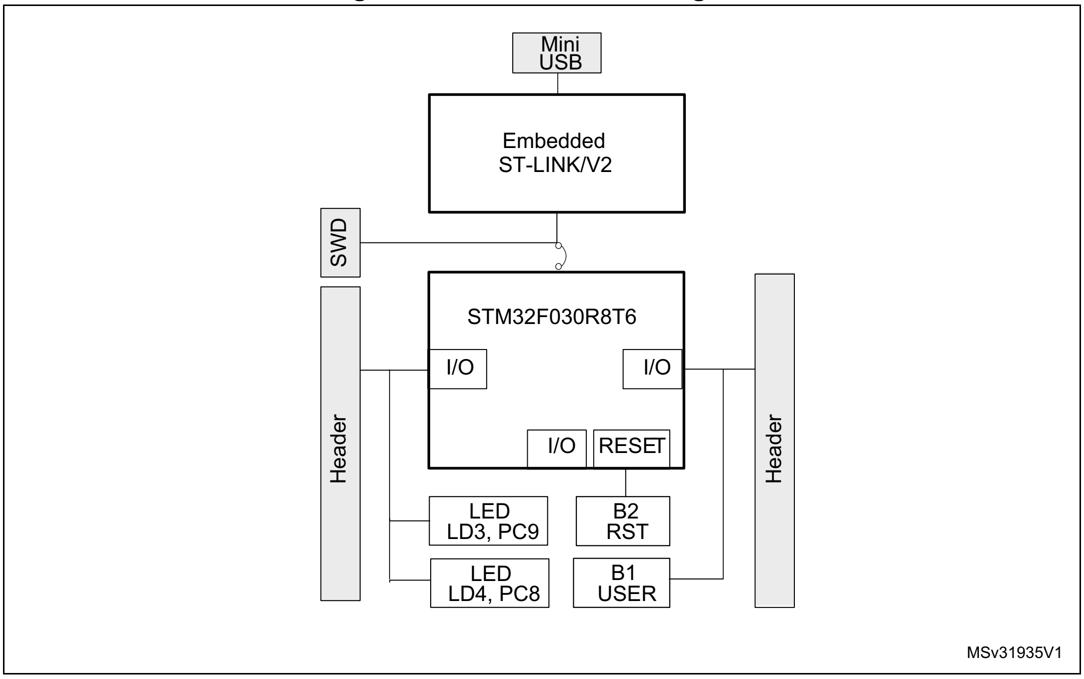
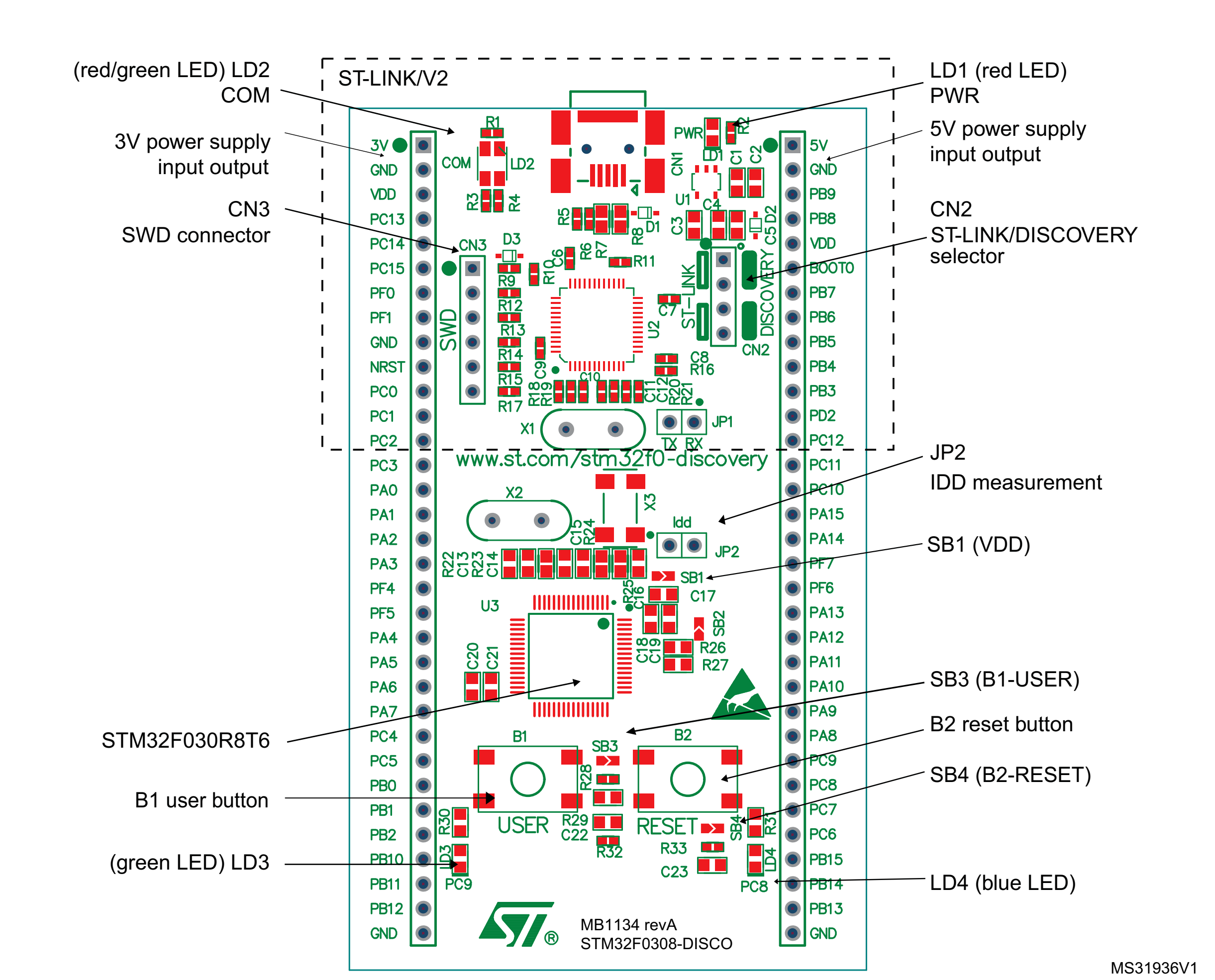
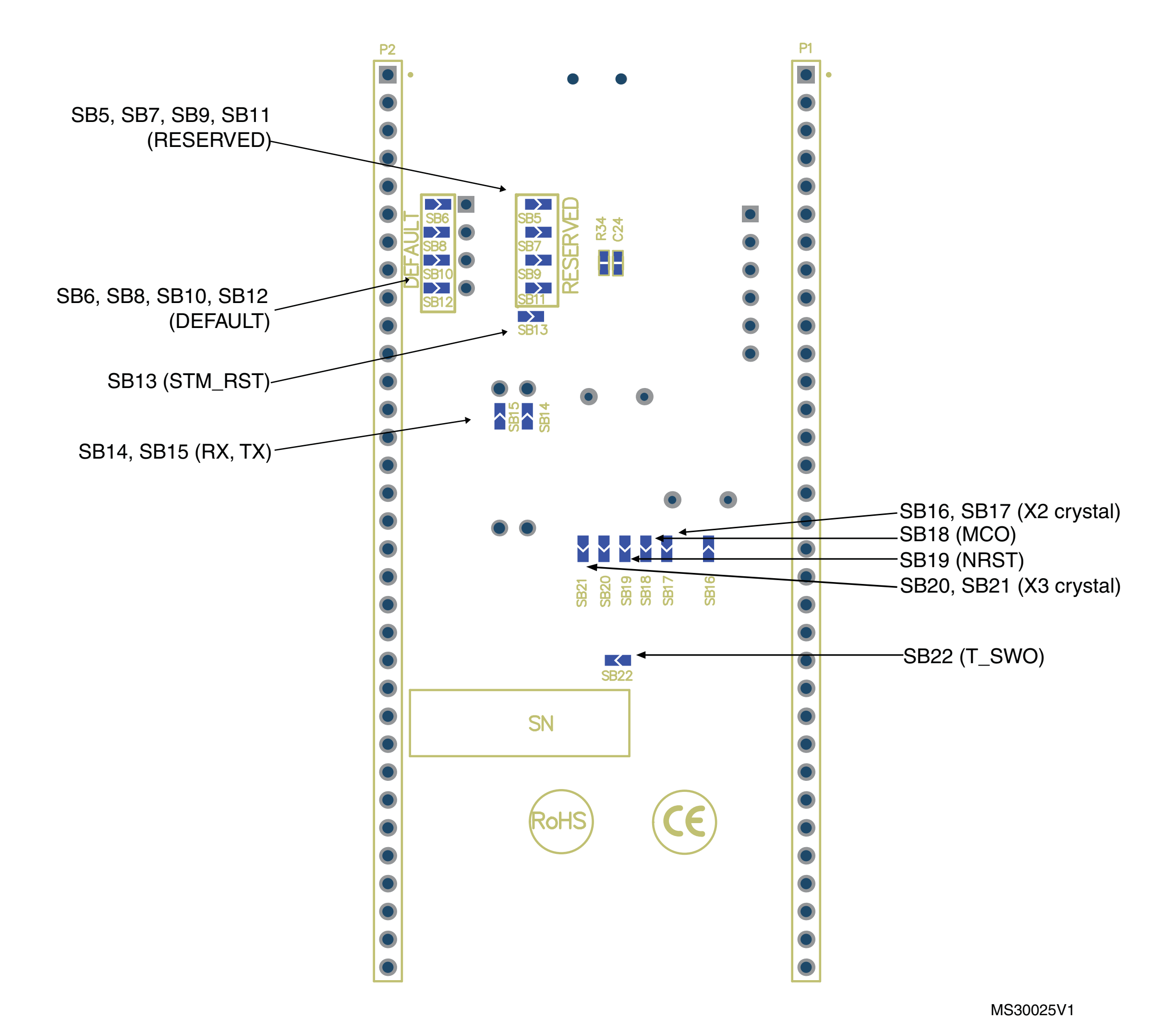


Figure 3. Top layout



Note: *Pin 1 of CN2, CN3, P1 and P2 connectors are identified by a square.*

Figure 4. Bottom layout

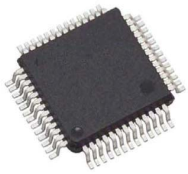


4.1 STM32F030R8T6 microcontroller

The STM32F030R8T6 microcontroller incorporates the high-performance ARM Cortex™-M0 32-bit RISC core operating at a 48 MHz frequency, high-speed embedded memories (up to 64 Kbytes of Flash memory and up to 8 Kbytes of SRAM), and an extensive range of enhanced peripherals and I/Os. All devices offer standard communication interfaces (up to two I^2Cs, up to two SPIs, and up to two USARTs), one 12-bit ADC, up to 6 general-purpose 16-bit timers and an advanced-control PWM timer.

Figure 5. STM32F030R8T6 package

STM32F030R8T6



64 Kbyte of Flash memory
8 Kbytes of SRAM

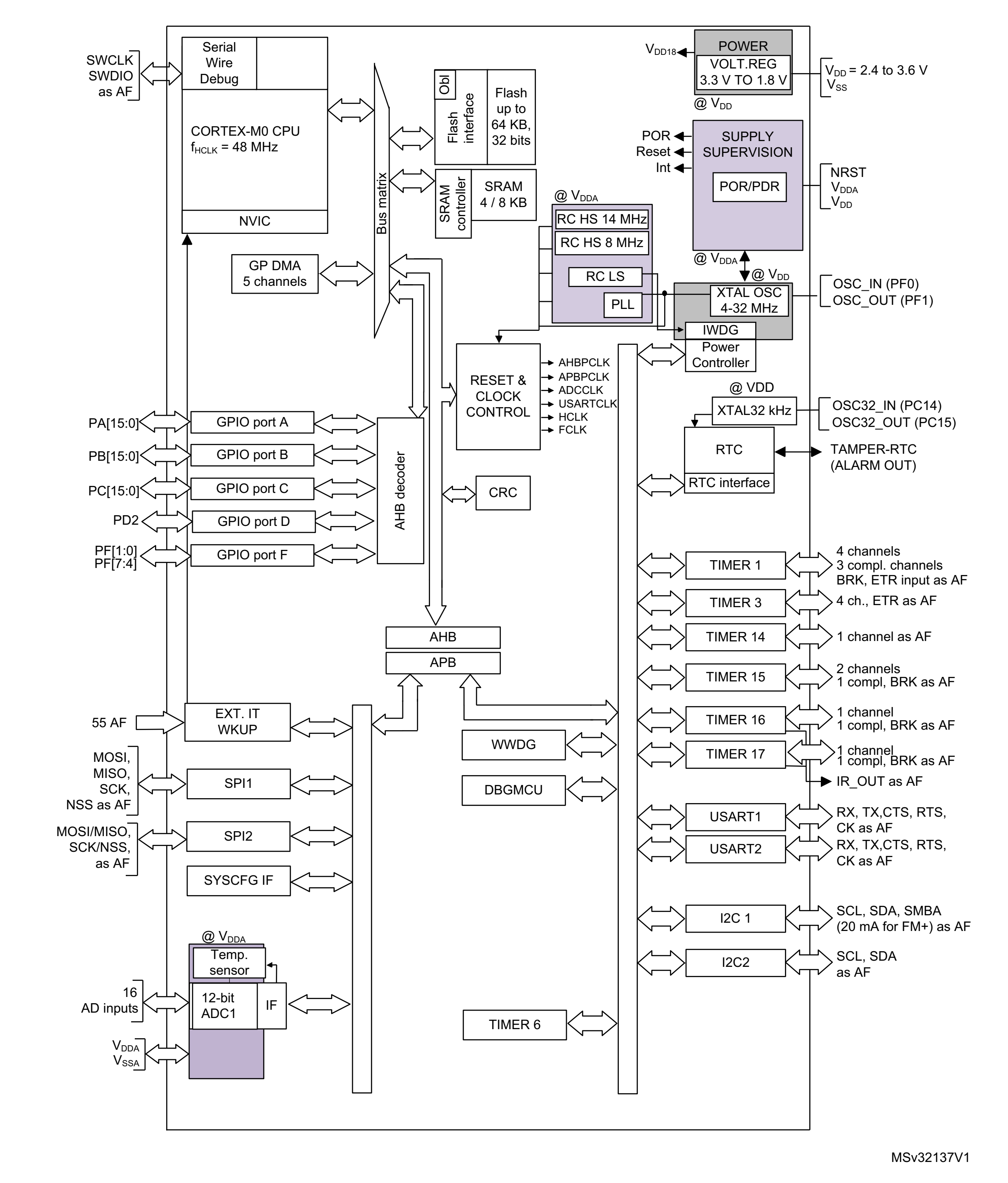
LQFP64 10 x 10 mm

MS31938V1

The STM32F030R8T6 microcontroller operates in the -40 to +85 °C temperature range, from a 2.4 V to 3.6 V power supply. A comprehensive set of power-saving modes allows the design of low-power applications.

These features make the STM32F030R8T6 microcontroller suitable for a wide range of applications such as application control and user interfaces, handheld equipment, A/V receivers and digital TV, PC peripherals, gaming platforms, e-bikes, consumer appliances, printers, scanners, alarm systems, video intercoms, and HVACs.

Figure 6. STM32F030R8T6 block diagram



4.2 Embedded ST-LINK/V2

The ST-LINK/V2 programming and debugging tool is integrated on the 32F0308DISCOVERY. The embedded ST-LINK/V2 can be used in 2 different ways according to the jumper states (see *Table 2*):

- Program/debug the MCU on board,
- Program/debug an MCU in an external application board using a cable connected to SWD connector CN3.

The embedded ST-LINK/V2 supports only SWD for STM32 devices. For information about debugging and programming features refer to user manual UM1075 (*ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32*) which describes in detail all the ST-LINK/V2 features.

Figure 7. Typical configuration



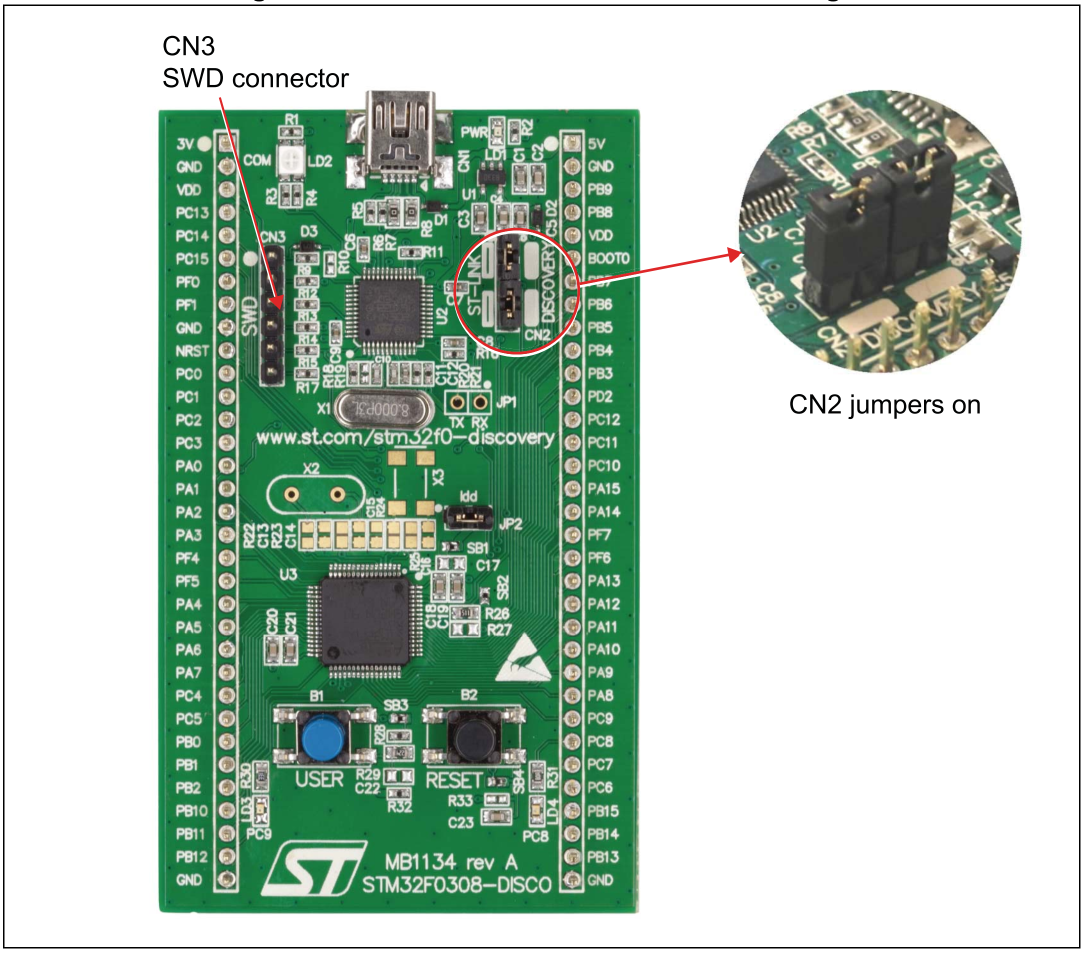
Table 2. Jumper states

Jumper state	Description
Both CN2 jumpers ON	ST-LINK/V2 functions enabled for on board programming (default)
Both CN2 jumpers OFF	ST-LINK/V2 functions enabled for application through external CN3 connector (SWD supported)

4.2.1 Using ST-LINK/V2 to program/debug the STM32 F0 on board

To program the STM32 F0 on board, simply plug in the two jumpers on CN2, as shown in *Figure 8* in red, but do not use the CN3 connector as that could disturb communication with the STM32F030R8T6 of the 32F0308DISCOVERY.

Figure 8. 32F0308DISCOVERY connections image



4.2.2 Using ST-LINK/V2 to program/debug an external STM32 application

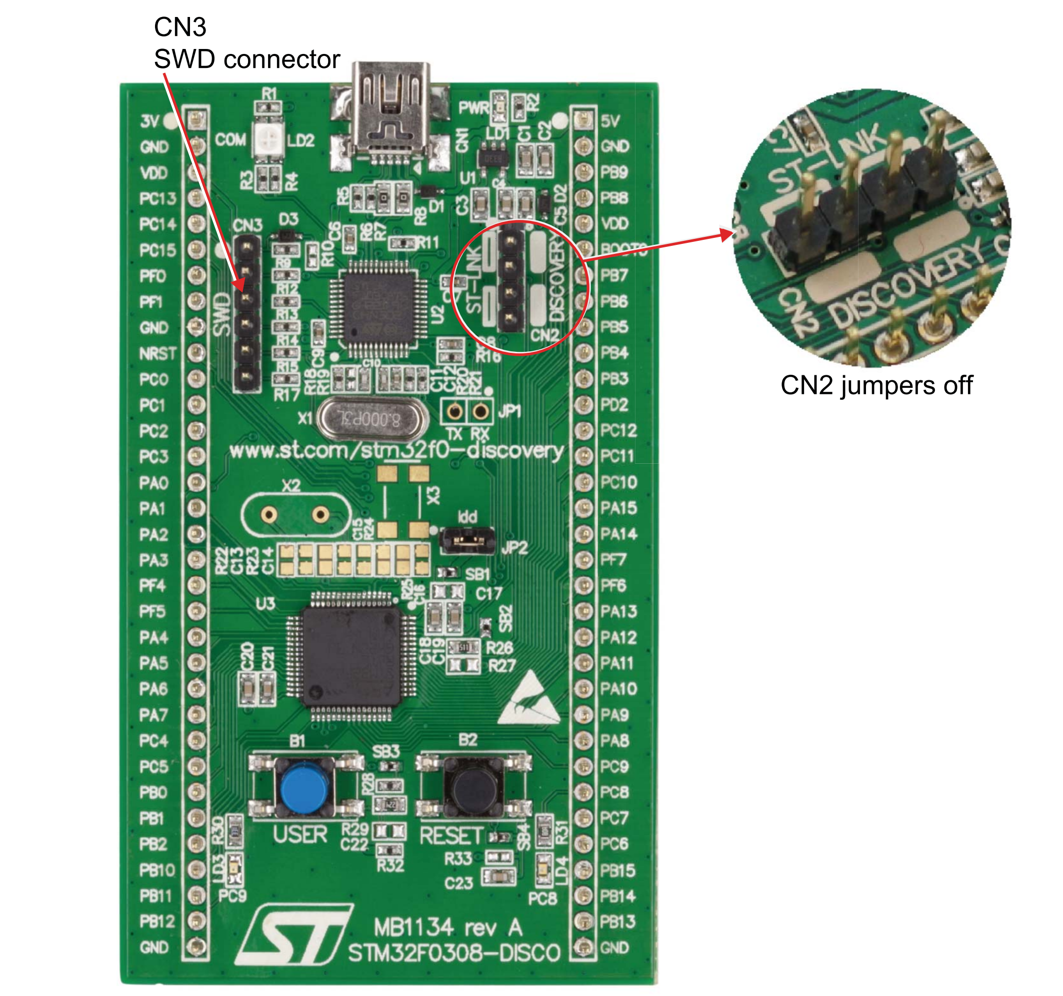
It is very easy to use the ST-LINK/V2 to program the STM32 on an external application. Simply remove the 2 jumpers from CN2 as shown in *Figure 9*, and connect your application to the CN3 debug connector according to *Table 3*.

Note: SB19 and SB22 must be OFF if you use CN3 pin 5 in your external application.

Table 3. Debug connector CN3 (SWD)

Pin	CN3	Designation
1	VDD_TARGET	VDD from application
2	SWCLK	SWD clock
3	GND	Ground
4	SWDIO	SWD data input/output
5	NRST	RESET of target MCU
6	SWO	Reserved

Figure 9. ST-LINK connections image



4.3 Power supply and power selection

The power supply is provided either by the host PC through the USB cable, or by an external 5 V power supply.

The D1 and D2 diodes protect the 5 V and 3 V pins from external power supplies:

- 5 V and 3 V can be used as output power supplies when another application board is connected to pins P1 and P2.
  In this case, the 5 V and 3 V pins deliver a 5 V or 3 V power supply and power consumption must be lower than 100 mA.
- 5 V can also be used as input power supplies; for example, when the USB connector is not connected to the PC.
  In this case, the 32F0308DISCOVERY board must be powered by a power supply unit or by auxiliary equipment complying with standard EN-60950-1: 2006+A11/2009, and must be Safety Extra Low Voltage (SELV) with limited power capability.

4.4 LEDs

- LD1 PWR: Red LED indicates that the board is powered.
- LD2 COM: Tricolor LED (COM) advises on the communication status as follows:
  – Slow blinking Red LED/Off: At power on before USB initialization
  – Fast blinking Red LED/Off: After the first correct communication between PC and STLINK/V2 (enumeration)
  – Red LED On: When initialization between PC and ST-LINK/V2 is successfully finished
  – Green LED On: After successful target communication initialization
  – Blinking Red/Green LED: During communication with target
  – Red LED On: Communication finished and OK
  – Orange LED On: Communication failure
- User LD3: Green user LED connected to the I/O PC9 of the STM32F030R8T6.
- User LD4: Blue user LED connected to the I/O PC8 of the STM32F030R8T6.

4.5 Push buttons

- B1 USER: User push button connected to the I/O PA0 of the STM32F030R8T6.
- B2 RESET: Push button used to RESET the STM32F030R8T6.

4.6 JP2 (Idd)

Jumper JP2, labeled Idd, allows the consumption of STM32F030R8T6 to be measured by removing the jumper and connecting an ammeter.

- Jumper on: STM32F030R8T6 is powered (default).
- Jumper off: an ammeter must be connected to measure the STM32F030R8T6 current, (if there is no ammeter, the STM32F030R8T6 is not powered).

4.7 OSC clock

4.7.1 OSC clock supply

PF0 and PF1 can be used as GPIO or as HSE oscillator. By default these I/Os are configured as GPIO, so SB16 and SB17 are closed, SB18 is open and R22, R23, C13 and C14 are not populated.

An external HSE clock can be provided to the MCU in three ways:

- **MCO from ST-LINK**. From MCO of the STM32F103. This frequency cannot be changed, it is fixed at 8 MHz and connected to PF0-OSC_IN of the STM32F030R8T6. Configuration needed:
  - SB16, SB18 CLOSED
  - R22, R23 removed
  - SB17 OPEN
- **Oscillator onboard**. From X2 crystal (not provided). For typical frequencies and its capacitors and resistors, please refer to the STM32F030R8T6 datasheet. Configuration needed:
  - SB16, SB17, SB18 OPEN
  - R22, R23, C13, C14 soldered
- **Oscillator from external PF0**. From external oscillator through pin 7 of the P1 connector. Configuration needed:
  - SB16, SB17 CLOSED
  - SB18 OPEN
  - R22 and R23 removed

4.7.2 OSC 32 KHz clock supply

PC14 and PC15 can be used as GPIO or as LSE oscillator. By default these I/Os are configured as GPIO, so SB20 & SB21 are closed and X3, R24, R25 are not populated.

An external LSE clock can be provided to the MCU in two ways:

- **Oscillator onboard**. From X3 crystal (not provided). Configuration needed:
  - SB20, SB21 OPEN
  - C15, C16, R24 and R25 soldered.
- **Oscillator from external PC14**. From external oscillator trough the pin 5 of P1 connector. Configuration needed:
  - SB20, SB21 CLOSED
  - R24 and R25 removed

4.8 Solder bridges

Table 4. Solder bridge settings

Bridge	State[1]	Description
SB16,17 (X2 crystal)[2]	**OFF**	X2, C13, C14, R22 and R23 provide a clock. PF0, PF1 are disconnected from P1.
	ON	PF0, PF1 are connected to P1 (R22, R23 and SB18 must not be fitted).
SB6,8,10,12 (Default)	**ON**	Reserved, do not modify.
SB5,7,9,11 (Reserved)	**OFF**	Reserved, do not modify.
SB20,21 (X3 crystal)	**OFF**	X3, C15, C16, R24 and R25 deliver a 32 KHz clock. PC14, PC15 are not connected to P1.
	ON	PC14, PC15 are only connected to P1 (R24, R25 must not be fitted).
SB4 (B2-RESET)	**ON**	B2 push button is connected to the NRST pin of the STM32F030R8T6 MCU.
	OFF	B2 push button is not connected the NRST pin of the STM32F030R8T6 MCU.
SB3 (B1-USER)	**ON**	B1 push button is connected to PA0.
	OFF	B1 push button is not connected to PA0.
SB1 (VDD_3)	**ON**	VDD_3 must be permanently connected to VDD for normal use.
	OFF	Reserved, do not modify.
SB14,15 (RX,TX)	**OFF**	Reserved, do not modify.
	ON	Reserved, do not modify.
SB19 (NRST)	**ON**	NRST signal of the CN3 connector is connected to the NRST pin of the STM32F030R8T6 MCU.
	OFF	NRST signal of the CN3 connector is not connected to the NRST pin of the STM32F030R8T6 MCU.
SB22 (T_SWO)	**ON**	SWO signal of the CN3 connector is connected to PB3.
	OFF	SWO signal is not connected.
SB13 (STM_RST)	**OFF**	No incidence on STM32F103C8T6 (ST-LINK/V2) NRST signal.
	ON	STM32F103C8T6 (ST-LINK/V2) NRST signal is connected to GND.
SB2 (BOOT0)	**ON**	BOOT0 signal of the STM32F030R8T6 MCU is held low through a 510 Ohm pull-down resistor.
	OFF	BOOT0 signal of the STM32F030R8T6 MCU can be set high through a 10 KOhm pull-up resistor R27 to solder.
SB18 (MCO)[2]	**ON**	Provides the 8 MHz for OSC_IN from MCO of STM32F030R8T6.
	OFF	See SB16, SB17 description.

1. Default SBx state is shown in bold.
2. OSC_IN clock comes from MCO if SB18 is ON and SB16,17 are OFF and comes from X2 if SB18 is OFF and SB16,17 are ON.

4.9 Extension connectors

The male headers P1 and P2 can connect the 32F0308DISCOVERY to a standard prototyping/wrapping board. STM32F030R8T6 GPI/Os are available on these connectors. P1 and P2 can also be probed by an oscilloscope, logical analyzer or voltmeter.

Table 5. MCU pin description versus board function

MCU pin			Board function								
Main function	**Alternate functions**	**LQFP64**	**Push button**	**LED**	**SWD**	**OSC**	**Free I/O**	**Power supply**	**CN3**	**P1**	**P2**
BOOT0	BOOT0	60									6
NRST	NRST	7	RESET		NRST				5	10	
PA0	USART1_CTS, USART2_CTS, ADC_IN0, RTC_TAMP2, WKUP1	14	USER							15	
PA1	USART1_RTS, USART2_RTS, EVENTOUT, ADC_IN1	15								16	
PA2	USART1_TX, USART2_TX, TIM15_CH1, ADC_IN2	16								17	
PA3	USART1_RX, USART2_RX, TIM15_CH2, ADC_IN3	17								18	
PA4	SPI1_NSS, USART1_CK USART2_CK, TIM14_CH1, ADC_IN4	20								21	
PA5	SPI1_SCK, ADC_IN5	21								22	

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function								
Main function	Alternate functions	LQFP64	Push button	LED	SWD	OSC	Free I/O	Power supply	CN3	P1	P2
PA6	SPI1_MISO, TIM3_CH1, TIM1_BKIN, TIM16_CH1, EVENTOUT, ADC_IN6	22								23	
PA7	SPI1_MOSI, TIM3_CH2, TIM14_CH1, TIM1_CH1N, TIM17_CH1, EVENTOUT, ADC_IN7	23								24	
PA8	USART1_CK, TIM1_CH1, EVENTOUT, MCO	41									25
PA9	USART1_TX, TIM1_CH2, TIM15_BKIN, I2C1_SCL	42									24
PA10	USART1_RX, TIM1_CH3, TIM17_BKIN, I2C1_SDA	43									23
PA11	USART1_CTS, TIM1_CH4, EVENTOUT	44									22
PA12	USART1_RTS, TIM1_ETR, EVENTOUT	45									21
PA13	IR_OUT, SWDIO	46			SWDIO				4		20
PA14	USART1_TX, USART2_TX, SWCLK	49			SWCLK				2		17

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function								
Main function	Alternate functions	LQFP64	Push button	LED	SWD	OSC	Free I/O	Power supply	CN3	P1	P2
PA15	SPI1_NSS, USART1_RX, USART2_RX, EVENTOUT	50									16
PB0	TIM3_CH3, TIM1_CH2N, EVENTOUT	26								27	
PB1	TIM3_CH4, TIM14_CH1, TIM1_CH3N	27								28	
PB2	-	28								29	
PB3	SPI1_SCK, EVENTOUT	55			SWO				6		11
PB4	SPI1_MISO, TIM3_CH1, EVENTOUT	56									10
PB5	SPI1_MOSI, I2C1_SMBA, TIM16_BKIN, TIM3_CH2	57									9
PB6	I2C1_SCL, USART1_TX, TIM16_CH1N	58									8
PB7	I2C1_SDA, USART1_RX, TIM17_CH1N	59									7
PB8	I2C1_SCL, TIM16_CH1	61									4
PB9	I2C1_SDA, IR_OUT, TIM17_CH1, EVENTOUT	62									3
PB10	I2C1_SCL, I2C2_SCL	29								30	

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function								
Main function	Alternate functions	LQFP64	Push button	LED	SWD	OSC	Free I/O	Power supply	CN3	P1	P2
PB11	I2C1_SDA, I2C2_SDA, EVENTOUT	30								31	
PB12	SPI1_NSS, SPI2_NSS, TIM1_BKIN, EVENTOUT	33								32	
PB13	SPI1_SCK, SPI2_SCK, TIM1_CH1N	34									32
PB14	SPI1_MISO, SPI2_MISO, TIM1_CH2N, TIM15_CH1	35									31
PB15	SPI1_MOSI, SPI2_MOSI, TIM1_CH3N, TIM15_CH1N, TIM15_CH2	36									30
PC0	EVENTOUT ADC_IN10	8								11	
PC1	EVENTOUT ADC_IN11	9								12	
PC2	EVENTOUT ADC_IN12	10								13	
PC3	EVENTOUT ADC_IN13	11								14	
PC4	EVENTOUT ADC_IN14	24								25	
PC5	ADC_IN15	25								26	
PC6	TIM3_CH1	37									29
PC7	TIM3_CH2	38									28
PC8	TIM3_CH3	39		BLUE							27
PC9	TIM3_CH4	40		GREEN							26
PC10	-	51									15

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function								
Main function	Alternate functions	LQFP64	Push button	LED	SWD	OSC	Free I/O	Power supply	CN3	P1	P2
PC11	-	52									14
PC12	-	53									13
PC13	RTC_TAMP1, RTC_TS, RTC_OUT, WKUP2	2								4	
PC14-OSC32_IN	OSC32_IN	3				OSC32_IN				5	
PC15-OSC32_OUT	OSC32_OUT	4				OSC32_OUT				6	
PD2	TIM3_ETR	54									12
PF0-OSC_IN	OSC_IN	5				OSC_IN				7	
PF1-OSC_OUT	OSC_OUT	6				OSC_OUT				8	
PF4	EVENTOUT	18								19	
PF5	EVENTOUT	19								20	
PF6	I2C1_SCL, I2C2_SCL	47									19
PF7	I2C1_SDA, I2C2_SDA	48									18
VDD_3	VDD	1								3	
VDD_1		64									
VDD_2		32									
VDDA		13									

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function								
Main function	Alternate functions	LQFP64	Push button	LED	SWD	OSC	Free I/O	Power supply	CN3	P1	P2
VSS_1		63									
VSS_2		31									
VSSA		12									
								5V			1
								3V		1	
								VDD			5
								GND		2	2
					GND			GND	3		
								GND		9	
								GND		33	33

5 Connecting modules on the prototyping board

This section gives some examples of how to connect ready-to-use modules available from different manufacturers to the STM32F030 Value Line Discovery kit via the prototyping board included in the kit.

Software examples, based on the connections described below, are available at *www.st.com/stm32f0-discovery*.

5.1 Mikroelektronica accessory boards

Mikroelektronika, http://www.mikroe.com, has specified two standard connectors for their accessory boards, named mikroBUS™ (http://www.mikroe.com/mikrobus_specs.pdf) and IDC10.

MikroBUS™ is a 16-pin connector to connect accessory boards very quickly and easily to a microcontroller board through SPI, USART or I^2C communications, along with additional pins such as Analog Input, PWM and Interrupt.

The set of mikroElektronika boards compatible with mikroBUS™ is called “Click boards”.

IDC10 is a 10-pin connector to connect the general purpose I/O of an MCU to other accessory boards.

The tables below are one solution for connecting mikroBUS™ and IDC boards to the 32F0308DISCOVERY; this solution used in the different examples is available at *www.st.com/stm32f0-discovery*.

Table 6. Connecting using mikroBUS™

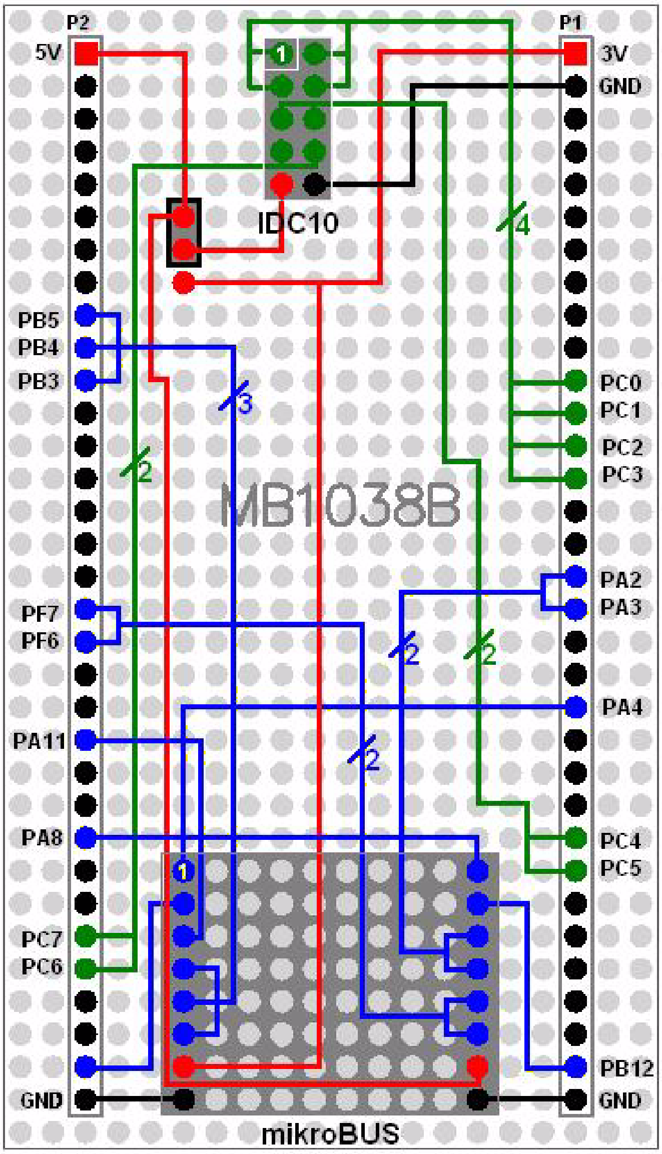
Mikroelektronica mikroBUS™		32F0308DISCOVERY	
Pin	Description	Pin	Description
AN	Analog pin	PA4	DAC1_OUT
RST	Reset pin	PB13	GPIO OUTPUT (5V tolerant)
CS	SPI Chip Select line	PA11	GPIO OUTPUT (5V tolerant)
SCK	SPI Clock line	PB3	SPI1_SCK
MISO	SPI Slave Output line	PB4	SPI1_MISO
MOSI	SPI Slave Input line	PB5	SPI1_MOSI
PWM	PWM output line	PA8	TIM1_CH1
INT	Hardware Interrupt line	PB12	GPIO INPUT EXTI (5V tolerant)
RX	UART Receive line	PA3	USART2_RX
TX	UART Transmit line	PA2	USART2_TX
SCL	I2C Clock line	PF6	I2C2_SCL
SDA	I2C Data line	PF7	I2C2_SDA
5V	VCC 5V power line	5V	Power line

Table 7. Connecting using IDC10

Mikroelektronica IDC10 connector		32F0308DISCOVERY	
P0	GPIO	PC0	GPIO OUTPUT (3.3V tolerant)
P1	GPIO	PC1	GPIO OUTPUT (3.3V tolerant)
P2	GPIO	PC2	GPIO OUTPUT (3.3V tolerant)
P3	GPIO	PC3	GPIO OUTPUT (3.3V tolerant)
P4	GPIO	PC4	GPIO OUTPUT (3.3V tolerant)
P5	GPIO	PC5	GPIO OUTPUT (3.3V tolerant)
P6	GPIO	PC6	GPIO OUTPUT (5V tolerant)
P7	GPIO	PC7	GPIO OUTPUT (5V tolerant)
VCC	VCC 5V power line	3V	VDD
GND	Reference Ground	GND	VSS
P0	GPIO	PC0	GPIO OUTPUT (3.3V tolerant)
P1	GPIO	PC1	GPIO OUTPUT (3.3V tolerant)
P2	GPIO	PC2	GPIO OUTPUT (3.3V tolerant)
P3	GPIO	PC3	GPIO OUTPUT (3.3V tolerant)

The *Figure 10* illustrates the connections between the 32F0308DISCOVERY and the 2 connectors, IDC10 and mikroBUS™.

Figure 10. Using IDC10 and mikroBUS™ connectors



5.2 ST MEMS “adapter boards”, standard DIL24 socket

STMicroelectronics has defined a standard DIL24 connector to easily evaluate its MEMS sensors connected to a microcontroller through SPI or I2C communications.

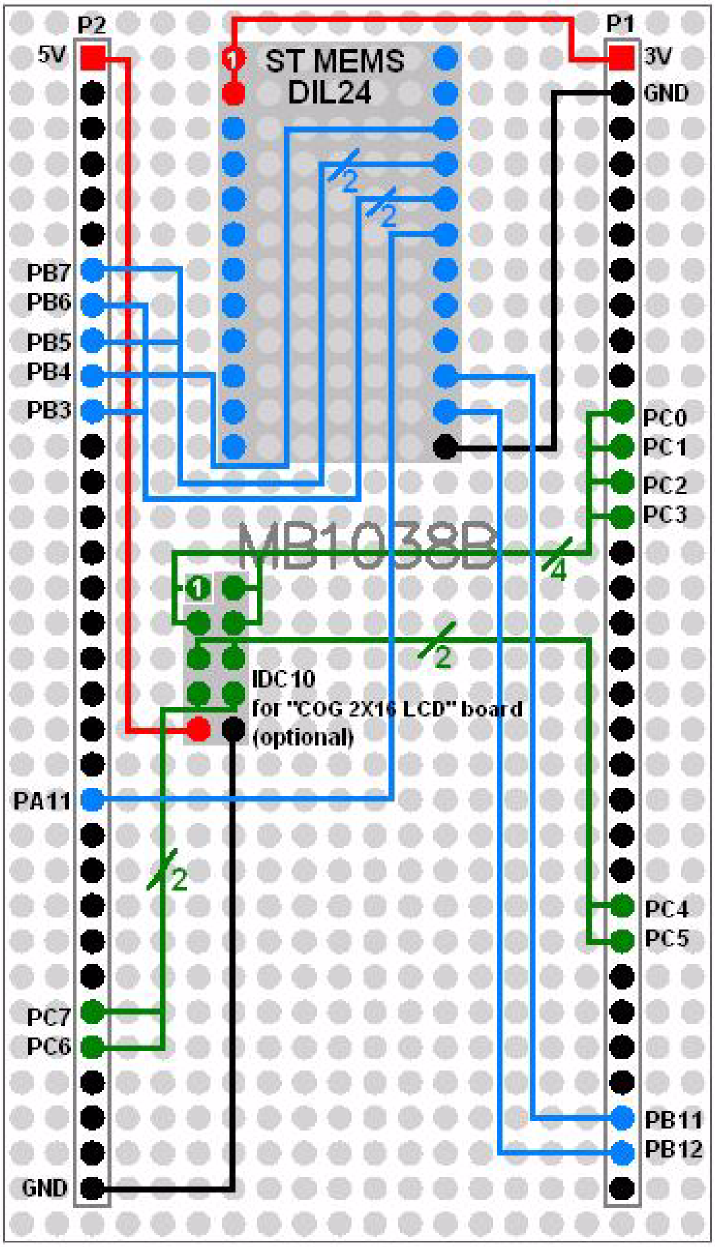
Table 8 is one solution for connecting the DIL24 boards to the 32F0308DISCOVERY, this solution is used in different examples and available at *www.st.com/stm32f0-discovery*.

Table 8. Connecting with a DIL24 board

ST MEMS DIL24 Eval board		32F0308DISCOVERY	
P01	VDD Power supply	3V	VDD
P02	Vdd_IO Power supply for I/O pins	3V	VDD
P03	NC		
P04	NC		
P05	NC		
P06	NC		
P07	NC		
P08	NC		
P09	NC		
P10	NC		
P11	NC		
P12	NC		
P13	GND 0V supply	GND	GND
P14	INT1 Inertial interrupt 1	PB12	GPIO INPUT EXTI (5V tolerant)
P15	INT2 inertial interrupt 2	PB11	GPIO INPUT EXTI (5V tolerant)
P16	NC		
P17	NC		
P18	NC		
P19	CS - 0:SPI enabled 1:I2C mode	PA11	GPIO OUTPUT (5V tolerant)
P20	SCL (I2C serial clock) SPC (SPI serial clock)	PB6 PB3	I2C1_SCL SPI1_SCK
P21	SDA I2C Serial Data SDI SPI Serial Data Input	PB7 PB5	I2C1_SDA SPI1_MOSI
P22	SDO SPI Serial Data Output I2C less significant bit of the device address	PB4	SPI1_MISO
P23	NC		
P24	NC		

Figure 11 illustrates the connections between the 32F0308DISCOVERY and the DIL24 socket.

Figure 11. DIL24 socket connections



Supported MEMS adapter boards

Table 9 is a list of supported MEMS adapter boards as of April, 2012.

Table 9. Supported MEMS adapter boards

ST MEMS DIL24 Eval Board	Core product
STEVAL-MKI009V1	LIS3LV02DL
STEVAL-MKI013V1	LIS302DL
STEVAL-MKI015V1	LIS344ALH
STEVAL-MKI082V1	LPY4150AL
STEVAL-MKI083V1	LPY450AL
STEVAL-MKI084V1	LPY430AL
STEVAL-MKI085V1	LPY410AL
STEVAL-MKI086V1	LPY403AL
STEVAL-MKI087V1	LIS331DL
STEVAL-MKI088V1	LIS33DE
STEVAL-MKI089V1	LIS331DLH
STEVAL-MKI090V1	LIS331DLF
STEVAL-MKI091V1	LIS331DLM
STEVAL-MKI092V1	LIS331HH
STEVAL-MKI095V1	LPR4150AL
STEVAL-MKI096V1	LPR450AL
STEVAL-MKI097V1	LPR430AL
STEVAL-MKI098V1	LPR410AL
STEVAL-MKI099V1	LPR403AL
STEVAL-MKI105V1	LIS3DH
STEVAL-MKI106V1	LSM303DLHC
STEVAL-MKI107V1	L3G4200D
STEVAL-MKI107V2	L3GD20
STEVAL-MKI108V1	9AXISMODULE v1 [LSM303DLHC + L3G4200D]
STEVAL-MKI108V2	9AXISMODULE v2 [LSM303DLHC + L3GD20]
STEVAL-MKI110V1	AIS328DQ
STEVAL-MKI113V1	LSM303DLM
STEVAL-MKI114V1	MAG PROBE (based on LSM303DLHC)
STEVAL-MKI120V1	LPS331AP
STEVAL-MKI122V1	LSM330DLC
STEVAL-MKI123V1	LSM330D

Table 9. Supported MEMS adapter boards (continued)

ST MEMS DIL24 Eval Board	Core product
STEVAL-MKI124V1	10AXISMODULE [LSM303DLHC + L3GD20+ LPS331AP]
STEVAL-MKI125V1	A3G4250D

Note: For an up-to-date list, visit http://www.st.com/internet/evalboard/subclass/1116.jsp. The DIL24 boards are described as "adapter boards" in the field "General Description".

5.3 Arduino shield boards

Arduino™ is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. See http://www.arduino.cc for more information.

Arduino accessory boards are called "Shields" and can be easily connected to the 32F0308DISCOVERY according to the following table.

Table 10. Connecting with Arduino shields

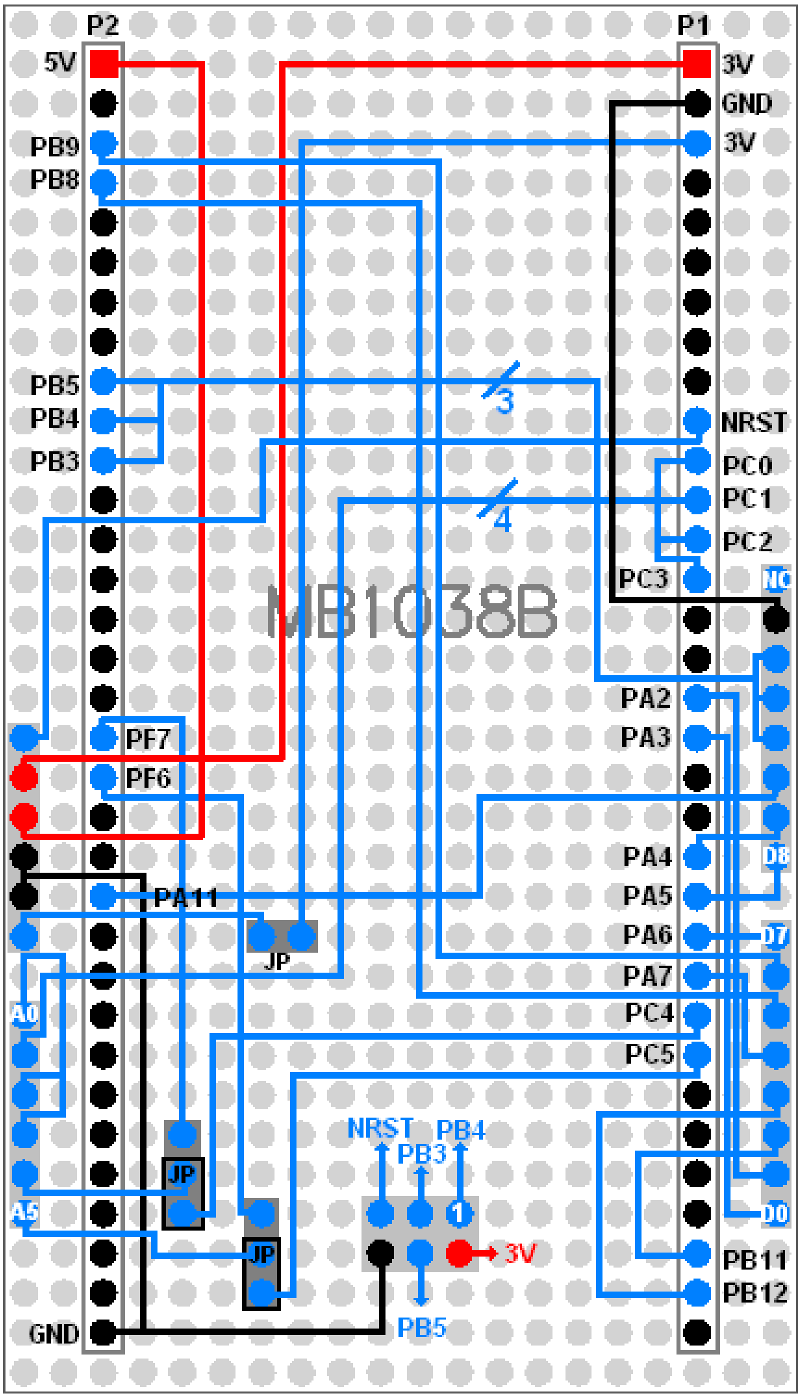
Arduino power connector		32F0308DISCOVERY	
Reset	Reset from Shield board	NRST	Reset discovery
3V3	VCC 3.3V power line	3V	VDD
5V	VCC 5V power line	5V	VDD
GND	Reference Ground	GND	Reference Ground
GND	Reference Ground	GND	Reference Ground
Vin	External alimentation	3 V	Jumper fitted to power board by External 3 V power supply.
Arduino analog in connector		**32F0308DISCOVERY**	
A0	Analog input or Digital pin 14	PC0	ADC_IN10
A1	Analog input or Digital pin 15	PC1	ADC_IN11
A2	Analog input or Digital pin 16	PC2	ADC_IN12
A3	Analog input or Digital pin 17	PC3	ADC_IN13
A4	Analog input or SDA or Digital pin 18	PC4 or PF7	ADC_IN14 or I2C2_SDA
A5	Analog input or SCL or Digital pin 19	PC5 or PF6	ADC_IN15 or I2C2_SCL

Table 10. Connecting with Arduino shields (continued)

Arduino digital connector		32F0308DISCOVERY	
D0	Digital pin 0 or RX	PA3	USART2_RX
D1	Digital pin 1 or TX	PA2	USART2_TX
D2	Digital pin 2 / External interrupt	PB12	EXTI (5V tolerant)
D3	Digital pin 3 / Ext int or PWM	PB11	EXTI (5V tolerant) or TIM2_CH4
D4	Digital pin 4	PA7	GPIO (3V tolerant)
D5	Digital pin 5 or PWM	PB9	TIM17_CH1
D6	Digital pin 6 or PWM	PB8	TIM16_CH1
D7	Digital pin 7	PA6	GPIO (3V tolerant)
D8	Digital pin 8	PA5	GPIO (3V tolerant)
D9	Digital pin 9 or PWM	PA4	TIM14_CH1
D10	Digital pin 10 or CS or PWM	PA11	TIM1_CH4
D11	Digital pin 11 or MOSI or PWM	PB5	SPI1_MOSI or TIM3_CH2
D12	Digital pin 12 or MISO	PB4	SPI1_MISO
D13	Digital pin 13 or SCK	PB3	SPI1_SCK
GND	Reference Ground	GND	Reference Ground
AREF	ADC voltage reference	NC	Not connected
Arduino ICSP connector		**32F0308DISCOVERY**	
1	MISO	PB4	SPI1_MISO
2	VCC 3.3V	3V	VDD
3	SCK	PB3	SPI1_SCK
4	MOSI	PB5	SPI1_MOSI
5	RST	NRST	Reset discovery
6	GND	GND	Reference Ground

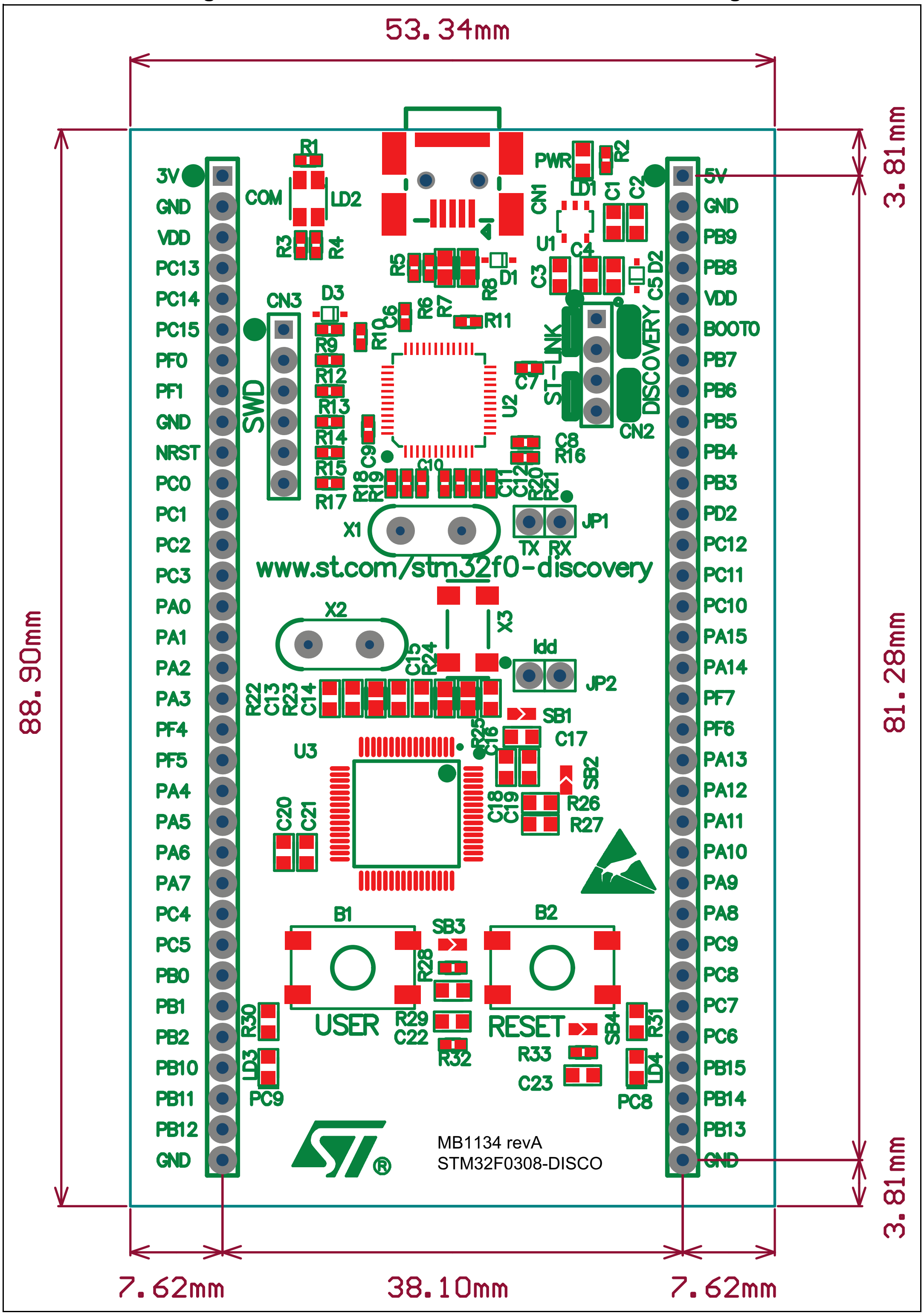
Figure 12 illustrates the connections between the 32F0308DISCOVERY and the Arduino shield boards.

Figure 12. Arduino shield board connections



6 Mechanical drawing

Figure 13. 32F0308DISCOVERY mechanical drawing



7 Electrical schematics

Figure 14. 32F0308DISCOVERY

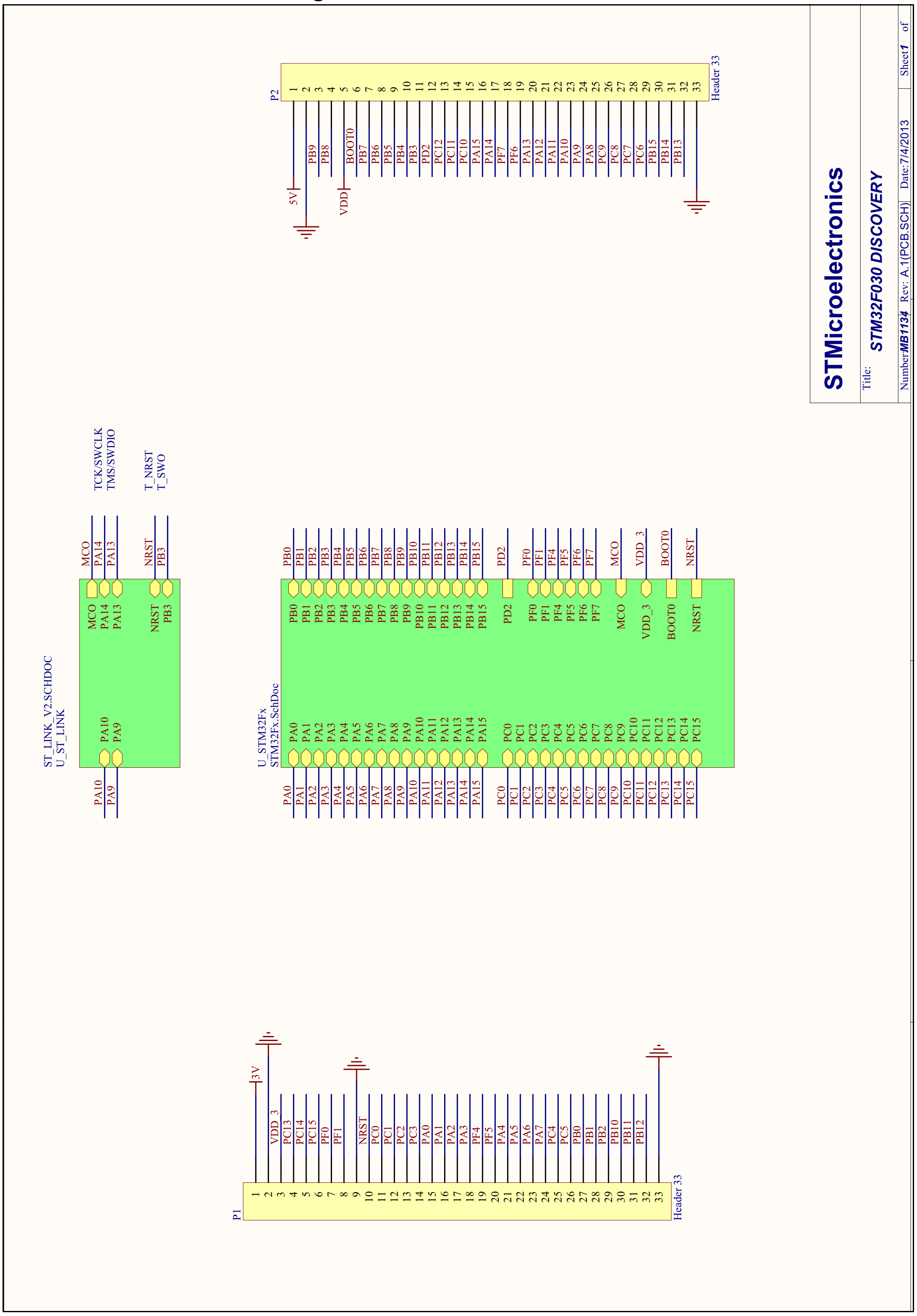


Figure 15. ST-LINK/V2 (SWD only)

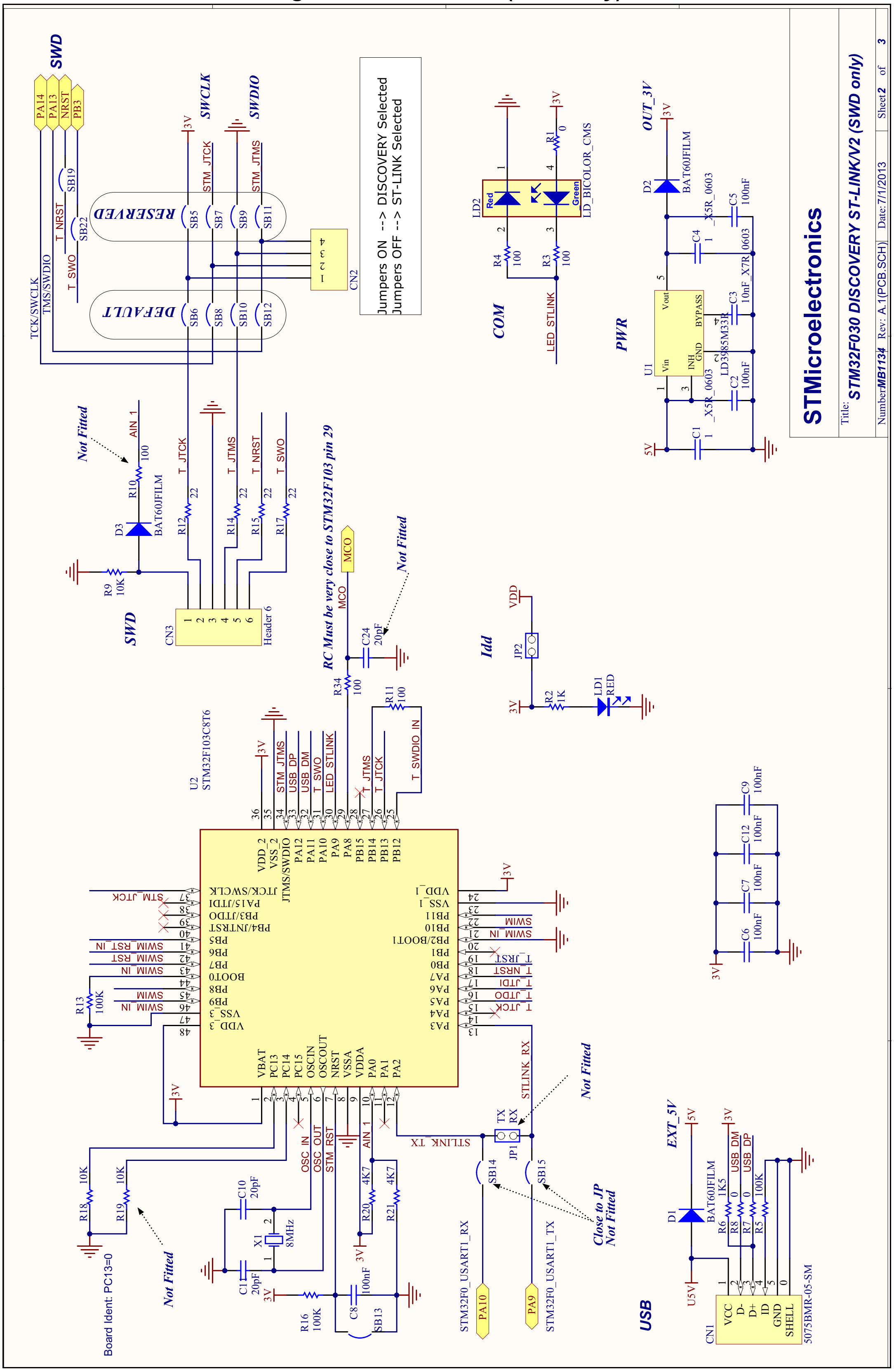
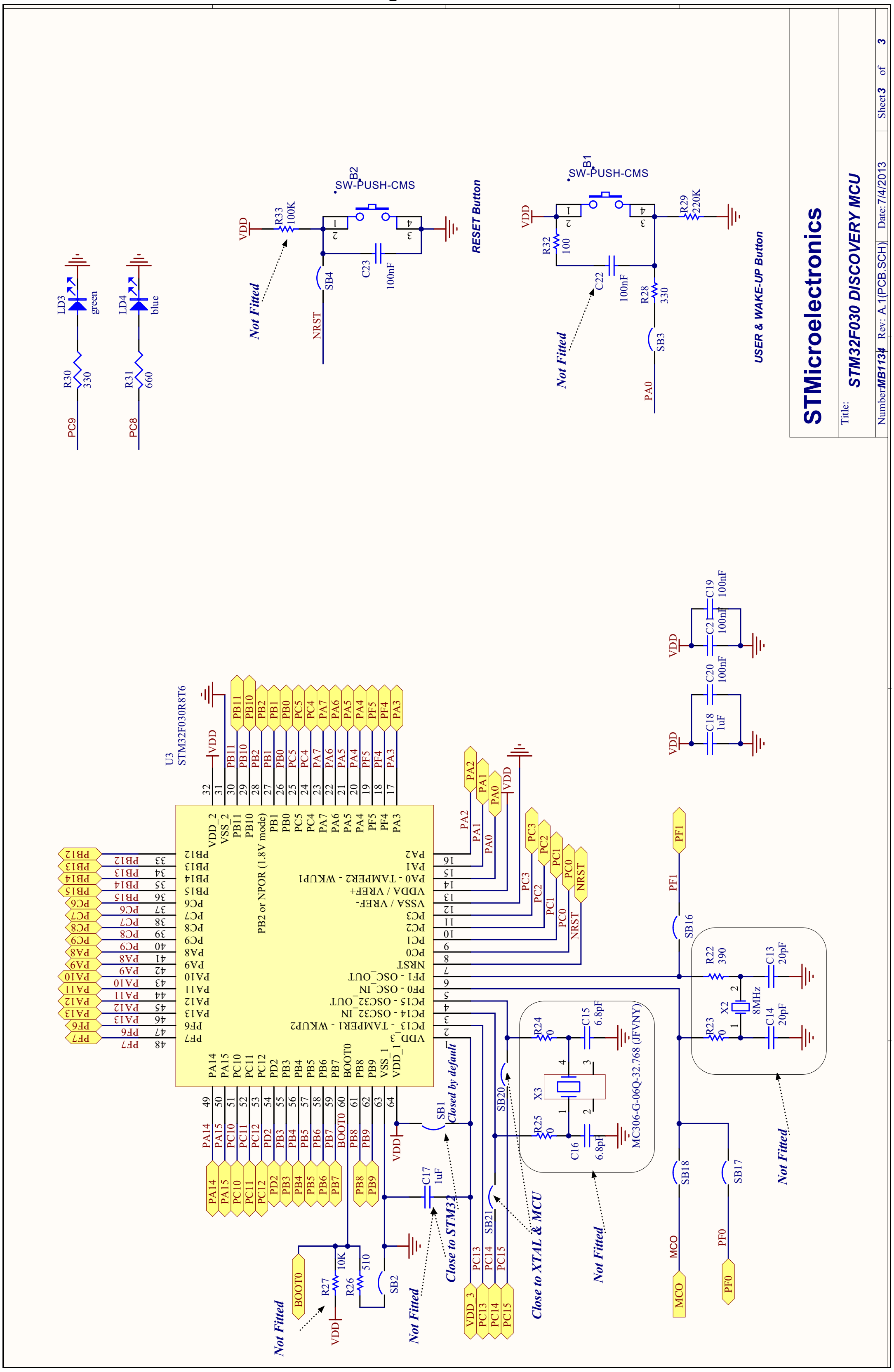


Figure 16. MCU



8 Revision history

Table 11. Document revision history

Date	Revision	Changes
03-Sep-2013	1	Initial release.